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VIA ELECTRONIC FILING

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: Written *Ex Parte* Notice, GN Docket No. 14-177, IB Docket Nos. 15-256 and 97-95; RM-11664; and WT Docket No. 10-112

Dear Ms. Dortch:

The Boeing Company ("Boeing"), through its counsel, hereby responds to the July 7 letters of Straight Path Communications, Inc. ("Straight Path") and CTIA.[1] In these letters, Straight Path and CTIA again assert a view of spectrum "sharing" that severely and unnecessarily restricts the ability of satellite services to use the V-band on a co-primary basis to provide very high data rate services to consumers. In contrast, Boeing and the satellite industry have provided a detailed technical record demonstrating how real sharing is feasible and how the use of discrete, common-sense rules can provide for the growth of both terrestrial wireless and satellite services and serve the common goal of providing high quality broadband to U.S. consumers. With this goal in mind, Boeing takes this opportunity to briefly address several themes raised in the filings by Straight Path and CTIA.

The satellite industry is not seeking "preferential treatment"

CTIA suggests that "for decades, satellite interests have taken no action to launch satellites or file any applications for use of the 37-40 GHz band."[2] As CTIA is well aware, the satellite industry has been working steadily toward higher frequency, higher data rate communications in the V-band for a long time. Boeing has developed countless new technologies charting this progression, including the development of the high data-rate compact phased array antennas and network protocols necessary for high-frequency operations. Boeing's

[1] This ex parte reply is appropriately filed during the Sunshine period pursuant to Section 1.1206(b)(2)(iv) of the Commission's rules.

[2] Letter from Scott K. Bergmann, Vice President, Regulatory Affairs, CTIA, to Marlene H. Dortch, Secretary, Federal Communications Commission, GN Docket No. 14-177 et al, at 3 (Jul. 7, 2016) ("*CTIA July 7 Letter*").

recent application for authority to launch and operate a non-geostationary satellite orbit ("NGSO") system that would operate in the fixed-satellite service ("FSS") in the V-band represents a detailed, technically-supported, well-considered proposal supported by thousands of hours of engineering studies, research and development, economic analysis, and regulatory engagement.

Ubiquitous high-data rate satellite broadband service in the V-band offers tremendous promise and opportunity for the public interest, and Boeing has already made a commensurate investment in making this vision a reality. CTIA has absolutely no basis for suggesting that this project is an "opportunistic application[] only seeking to block new terrestrial uses of the spectrum."[3]

CTIA also suggests that Boeing's proposals represent "an unlimited and never-ending series of attempts to elevate satellite users and obtain preferential access to millimeter wave spectrum," which would "introduce uncertainty about licensees' rights in the band and risk delaying or foreclosing deployment of 5G."[4] Throughout this proceeding, Boeing and the rest of the satellite industry have supported common sense rules that would promote true sharing between these important services. As Boeing has previously explained, the proposed earth station operations in the 37.5-40.0 GHz band would be receive-only and therefore do not present a risk of interference to terrestrial wireless operations. Nor will satellite downlinks in this band present a risk of interference, as Boeing has shown in the technical analysis already in the record. In short, the satellite industry has proposed a discrete, feasible, and technically-supported plan for sharing that will provide regulatory certainty and growth opportunity for both satellite and terrestrial operators.

Boeing has a long and successful record of satellite operations

CTIA further argues without foundation that "satellite companies have a long history of filing speculative applications that ultimately fail to bear fruit."[5] It is remarkable that CTIA would suggest that Boeing does not have a successful record of manufacturing and launching satellites. Boeing is the world's largest manufacturer of commercial and government satellites and has been a leader in the satellite industry since the launch of Syncom, the first geosynchronous communications satellite, more than 50 years ago. In 1995, Boeing introduced the 702 spacecraft family and today more than three dozen have flown, with more than a dozen

[3] *Id.* at 4.

[4] *Id.* at 1-2.

[5] *Id.* at 7.

more currently in production. In 2014, the Boeing 502 satellite was introduced, providing an option for customers that desire a smaller satellite. Boeing also recently completed the construction and delivery of twelve next-generation Block IIF satellites for the Global Positioning System ("GPS"), which complement the capabilities of the initial forty GPS NGSO satellites that were also constructed by Boeing. As a contractor for the U.S. military, Boeing has consistently pushed the envelope in the performance of satellite communications hardware, and these innovations have fueled ongoing improvements in satellite services available to consumers.

Satellite services are making intensive use of spectrum

Straight Path proposes that additional satellite spectrum is not required because "[s]atellite already enjoys a vast amount of spectrum in the 1-60 GHz" and "[a] total of more than 16 GHz of spectrum is already available to satellite services…[with] large segments (*e.g.* 40-42 GHz , 47.2-50.2 GHz lying fallow)."[6] Satellite services are already intensively using C-band, Ka-band, and Ku-band. In the V-band, the satellite industry has undertaken a great deal of research and development, as has the wireless industry. It is inconsistent, at best, to point out that the satellite industry has not yet built out in the V-band when the wireless industry has yet to do so either, despite longstanding allocations for terrestrial fixed and mobile wireless. The technology to enable large scale commercial satellite and terrestrial operations in these bands is just becoming available, and both the satellite and wireless industries are moving quickly to employ these new technologies to meet ever-growing consumer demand.

Satellite will be a significant provider of broadband services

Straight Path asserts that "satellite broadband is not, and will not, be a significant provider of broadband access to the American public, including rural population."[7] For this proposition Straight Path cites to past and questionable surveys about geostationary systems with very different data rate and latency characteristics, which are not at all reflective of the offerings of the proposed V-band low Earth orbit systems. Moreover, the Commission's findings consistently show that rural and hard to reach areas remain stubbornly unserved by terrestrial

[6] Letter from Davidi Jonas, CEO and President, Straight Path Communications, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, GN Docket No. 14-177, at Attachment A (Slide 4) (Jul. 7, 2014) (*Straight Path Oral Ex Parte Notice*").

[7] Letter from Davidi Jonas, CEO and President, Straight Path Communications, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, GN Docket No. 14-177, at 4 (Jul. 7, 2014) ("*Straight Path Written Ex Parte*").

broadband.[8] Even in those areas that are served, "broadband" speeds in remote areas remain markedly lower than those available in more urban, populous, and profitable areas: today, 96 percent of those living in urban areas of the United States have access to broadband Internet with speeds at least 25 MB down/3 MB up, but 39 percent of those in rural areas – 23 million people – do not.[9] High speed V-band satellite service will bring true broadband speeds to Americans regardless of where they live, representing a revolution in the concept of broadband and also a valuable tool for closing the broadband service gap.

Base station power levels of 62 dBm/100 MHz is a longstanding expectation for wireless

Straight Path repeats its claim that "the 75 dBm per 100 MHz base station EIRP limit is crucial to achieving sufficient wide area coverage in a variety of 5G deployment scenarios."[10] Citing to its own comments as well as filings by Nokia, Intel, and Samsung, Straight Path argues that "reducing" the EIRP limit to 62 dBm per 100 MHz would result in significant reduction of throughput and capacity."[11] The dates of the cited filings, however, show that the wireless industry's push for 75 dBm limit is a very recent development, first appearing in February of this year. In fact, a base station maximum power level of 62 dBm has been the baseline assumption in this proceeding, based on the Commission's conclusion in the Spectrum Frontiers NPRM.[12]

Simply put, the submissions to the record do not provide a basis for abandoning the Commission's well-considered conclusion. Further, as Boeing has explained, the goal of the satellite industry in this proceeding has been to seek a mutually workable sharing solution that employs good engineering practices to maximize the value of this spectrum for both terrestrial wireless and satellite users.

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[8] *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, GN Docket No. 15-191, 2016 Broadband Progress Report, FCC 16-6, 31 FCC Rcd 699, ¶ 12 (2016) ("*2016 Broadband Progress Report*"). The broadband crisis is particularly acute on Tribal Lands where 41 percent of those living on Tribal Lands – more than 1.5 million people – lack access, including 68 percent of those living on Tribal Lands in rural areas. *Id.,* ¶ 88.

[9] *2016 Broadband Progress Report* at Appendix D.

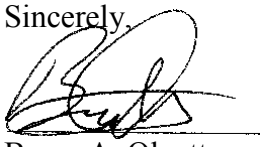
[10] *Straight Path Written Ex Parte* at 2.

[11] *Id.* at 2.

[12] Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, GN Docket No. 14-177, Petition for Rulemaking of the Fixed Wireless Communications Coalition to Create Service Rules for the 42-43.5 GHz Band, RM-11664, *et al.*, *Notice of Proposed Rulemaking*, FCC 15-138, ¶ 274 (2015) ("*Spectrum Frontiers NPRM*").

Thank you for your attention to this matter. Please contact the undersigned if you have any questions.

Sincerely,



Bruce A. Olcott
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